

Current Population Size and Status

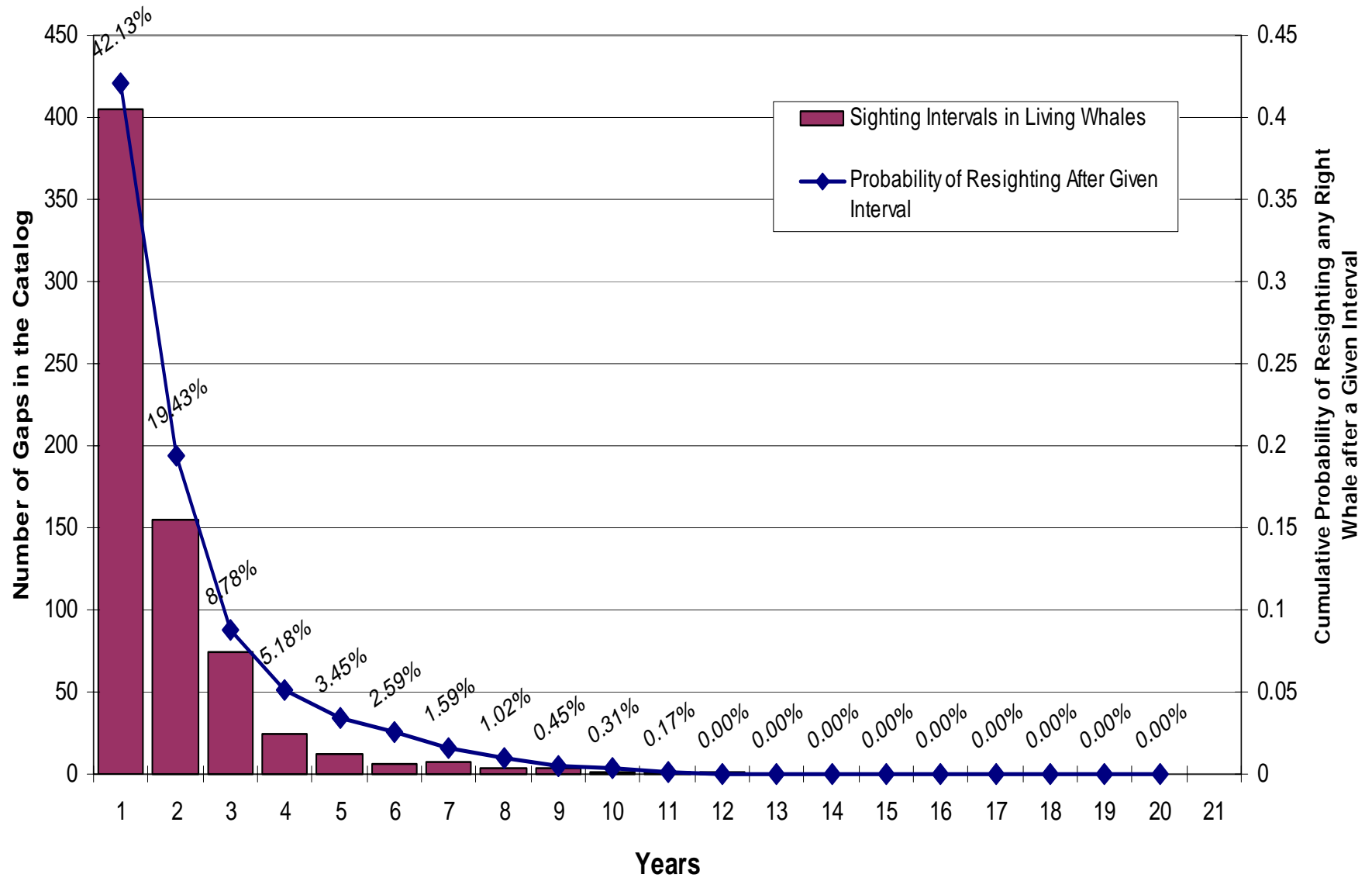
- ◆ About 300 right whales survive in the North Atlantic today – status derived from over 20,000 sighting records 1935-present.
- ◆ This population is isolated from all other populations of right whales.
- ◆ Four independent models show this population is declining.
- ◆ However, the most recent model by Fujiwara and Caswell (2001) suggests that saving as few as 2 females per year could reverse the trend.

Mortality in North Atlantic Right Whales

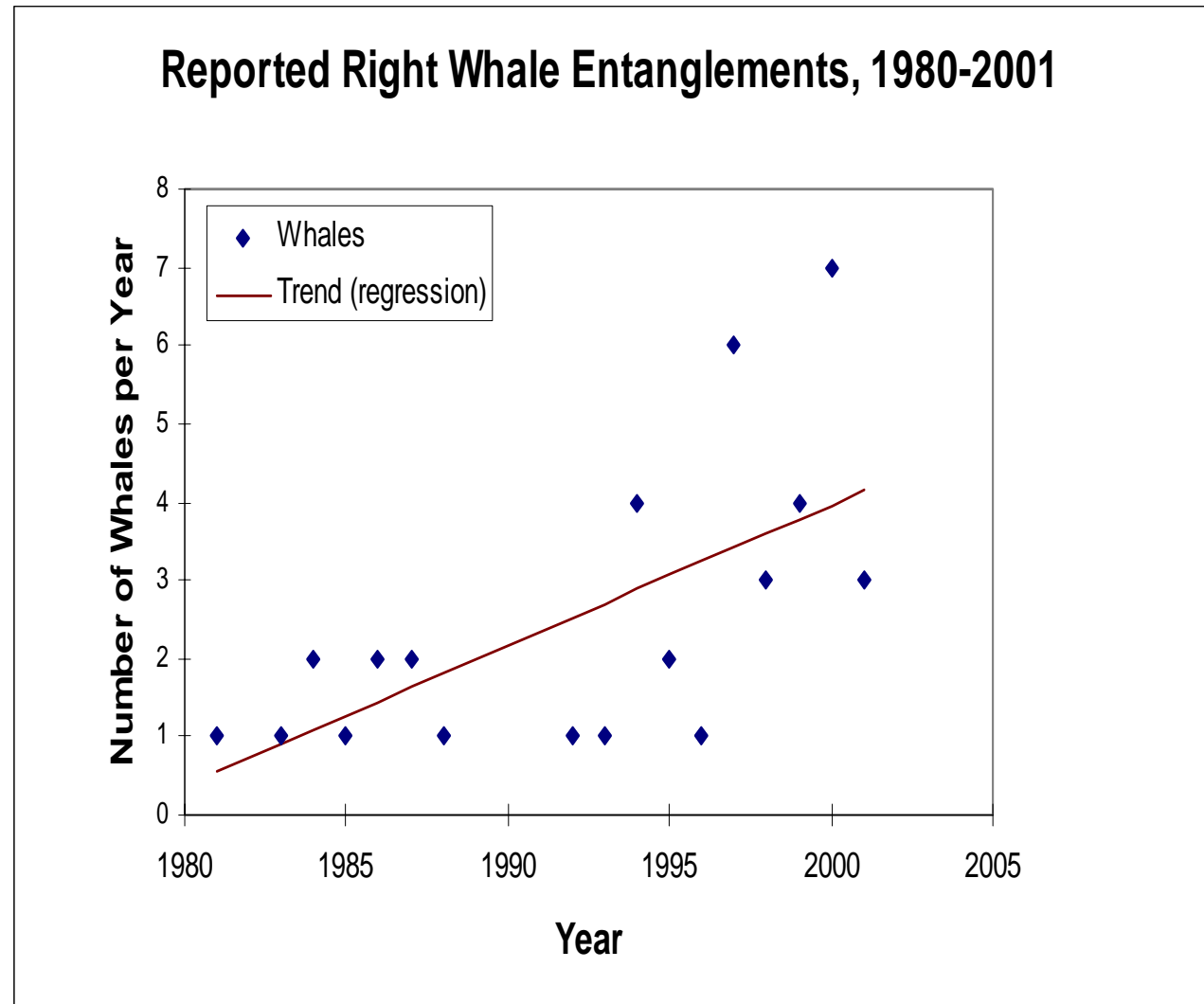
- ♦ **At least 44% of all deaths are due to human activities.**
- ♦ **54 deaths, 1970-2001: 19 from ships (35%), 5 from fishing gear (9%), 15 from unknown causes (28%) and 15 from natural causes (28%).**
- ♦ **Many animals disappear from the population, i.e., not all deaths are seen on the beach.**
- ♦ **Recent analysis indicates that 10 additional whales have died immediately after entanglement in fishing gear.**

Year	Mo.	Day	Status	ID#	Sex	Ag	Area	Type	Dis	Last sight	diam.	Comments
1981	8	27	A	1152	M	U	BOF	U	N	26-Sep-97		Green netting tightly w rapped around tail. Unknown when acquired.
1983	5	15	A	1306	M	U	MA	LI	N	6-Sep-97		Several w raps of lobster line and buoys around body. No
1984	9	6	A	1308	F	1	BOF	GN	N	12-Sep-97		Strip of monofilament gillnetting through mouth, along body. No
1984	8	26	PD	Unid	M?	U	NFLD	CT	A	N/A		Wrapped in a cod trap. Disentanglement efforts unsuccessful. After
1985	5	2	A	1406	F	1	ME	LI	Y	4-Sep-97		Lobster line around tail with buoys and traps attached. Disentangled.
1986	5	15	A	1411	M	2	GSC	U	N	28 Sept.		Line of unknown origin tightly w rapped and embedded around tailstock.
1986	8	29	PD	1163	F	5	MB	U	N	12-Feb-92		Line through mouth. Line gone by 12 Feb. 1991. Skin lesions evident at
1987	7	10	A	1004	F	A	MB	U	N	25-Aug-97		~ 1 m of right fluke tip missing. Entanglement scars detected - line may
1987	9	25	A	1113	M	U	SS	U	N	16-Mar-95		Yellow polypro line through mouth - loose. Gone in 1991. Unknown
1988	11	9	D	Unid	U	U	BOF	LO	N	N/A		Lobster fishermen hauled a full w hale carcass to water's surface
1992	1	11	PD	Unid	U	C	GA,FL	U	N	--		~ 1 m long, 10 cm deep gash on dorsal fluke, entanglement scars on tail,
1993	7	9	PD	2233	F	1	GOM	LL,D	P	22-Aug-93		Found entangled in swordfish drift gillnet gear near Munson Canyon, off
1994	9	9	A	2320	F	U	BOF	GN	N	25-Aug-97		Small piece of yellow line with gillnetting attached seen coming out of
1994	1	7	A	1621	U	U	GA	U	N	4-Oct-97		Cut ~ 2.4 m long, max 30 cm deep running from lip edge on right side
1994	11	17	PD	2151	U	3	JL	U	A	--		Line tightly w rapped around forward end of rostrum with undetermined
1994	9	21	PD	1247	M	12	BOF	U	N	17-Aug-95	0.5	Tail stock tightly w rapped and embedded with several w raps of polypro
1995	9	16	A	2110	M	4	BOF	GN	P	1997		Gillnet bottom to surface line through mouth and ~150 m of line with
1995	7	17	D	2366	M	2	RI	LO	N+	N/A		8 w raps of lines from lobster gear embedded 8 cm into bone at base of
1996	1	6	A	1707	F	9	FL	U	A	25-Aug-97		Line of unknown origin w rapped around mid-body. Disentanglement
1997	7	15	A	1705	F	10	BOF	S?	N	6-Sep-97		Small amount of line with several small, oval black buoys attached
1997	4	12	A	1505	M	12	MB	U	N	26-Aug-97		Line of unknown origin through mouth with ~ 9 m trailing along right side
1997	9	12	A	2027	M	7	BOF	U	P	5-Mar-98	0.38	~ 600 feet of line through mouth and trailing. Partial disentanglement, ~
1997	6	24	A	1971	M	8	GSC	LO	Y	11-Sep-97		Severely entangled through mouth and around body in lobster gear.
1997	8	29	PD	2557	F	2	BOF	U	N+	19-Sep-97	0.5	Line of unknown origin crisscrossed across body and around at least
1997	8	23	PD?	2212	M	5	BOF	U	N	14-Sep-98		Several w raps of line w rapped around tail with undetermined amount of
1998	9	12	PD	2212	M	6	CCB	LI	Y	14-Sep-98	0.38	bouy line, single pot, 11/32 sink, 3/8 float
1998	9	14	PD	2212	M	6	CCB	LO	Y	14-Sep-98		Groundline, offshore type lobster gear
1998	7	24	PD	2212	M	6	CCB	U	Y	14-Sep-98	0.31	4-6 5/16" black and orange
1999	7	21	A	2710	F	2	BOF	PG	N	29-Mar-01	0.5	1/2"-7/16" red poly w/gangions
1999	5	19	A	1158	F	18	GSC	LO	P	7-Jan-01	0.38	15fm 3/8" ezhaul and hiflyer, offshore lobster
1999	6	5	A	2753	F	2	BOF	U	Y	14-Sep-00		Line, poly ball, and hi flyer
1999	5	10	D	2030	F	11	GOM	GN	A			7"mesh sink gillnet
2000	2	8	A	2920	U	U	CCB	U	N	28-May-00		single line
2000	3	23	A	1301	F	17	CCB	U	N	3-May-00		single line or wire
2000	5	31	A	1720	U	14	GOM	U	N	31-May-00		single line trailing
2000	3	27	A	1167	M	19	GSC	U	N	1-Aug-00		200' red line and buoy
2000	7	9	A	2746	U	3	BOF	U	P	25-Aug-00		lines and buoys
2000	8	18	A	2223	F	8	BOF	U	P	18-Aug-00	0.44	200' floating 7/16" blue rope
2000	3	1	PD	1130	M	21	CCB	U	N			line, yellow /w hite bullet buoy
2001	10	25	D	1238	M	#	GSL	S?	N		1	1' poly, probably danish seine
2001	6	8	PD	1102	M	21	GOM	U	A		0.63	5/8" floating poly line
2001	7	20	PD	2427	M	7	GOM	LO	Y			offshore line and polyball surface buoy system

Figure 3. Occurrence of Gaps in the Sighting History and the Cumulative Probability of Resighting After each Interval in Right Whales, 1980-2000

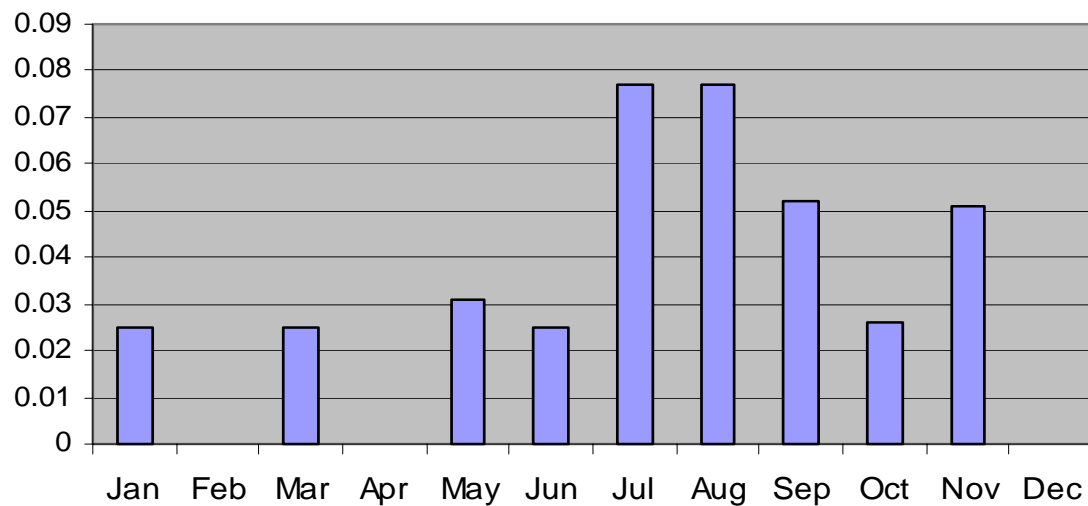


	Sex			
Year	F	M	U	
1981		1		1
1983		1		1
1984	1		1	2
1985	1			1
1986	1	1		2
1987	1	1		2
1988			1	1
1992			1	1
1993	1			1
1994	1	1	2	4
1995		2		2
1996	1			1
1997	2	4		6
1998		3		3
1999	4	4		4
2000	2	2	3	7
2001		3		3
Total	15	19	8	42



Month	Alive	Dead & PD	Total	%Tot.	Mortality	RiskFactor
Jan	2	1	3	7.6	33%	0.025
Feb	1	0	1	2.6	0	0
Mar	2	1	3	7.6	33%	0.025
Apr	1	0	1	2.6	0	0
May	5	1	6	15.4	20%	0.031
Jun	2	1	3	7.6	33%	0.025
Jul	4	3	7	17.9	43%	0.077
Aug	2	3	5	12.8	60%	0.077
Sep	5	2	7	17.9	29%	0.052
Oct	0	1	1	2.6	100%	0.026
Nov	0	2	2	5.1	100%	0.051
Dec	0	0	0	0	0%	0
Totals	24	15	39			

Entanglement Risk in Right Whales by Month



Right whale entanglements by gear type, 1980-2001

	Codtrap	Gillnet	Driftnet	Lob.In	Lob,Off	Pot Gear	Seine	Unknown	Total
Alive		3		2	2	1	1	15	24
Dead		1			2		1	1	5
Pres. Dead	1		1		2			6	10
Dupe Whale				1				2	3
Totals	1	4	1	3	6	1	2	24	42
Rate	2%	10%	2%	7%	14%	2%	5%	57%	100%
Mortality Rates	100%	25%	100%	0	67%	0	50%	46%	63%
RiskFactor	0.02	0.025	0.02	0	0.094	0	0.03	0.2622	

Risk factors for different gear types have probably changed recently with current modifications. Data not statistically robust. Unknown (unidentified) gear is the biggest problem.

Area	Alive	Dead and PD	Total
NFLD,GSL,SS	1	3	4
BOF	10	3	13
ME,JL	1	1	2
CCB,MB,MA	5	3	8
GOM	1	3	4
GSC	4	0	4
RI, NY, Mid Atlantic	0	1	1
GA, FL	2	1	3
	24	15	39

		Effectiveness	For Fishermen	For Whales	
Gear Modifications					
		Breakaways on Vertical Lines	Good	Poor	
		Breakaways at Headrope-Gillnets	Good, needs testing	Good	
		Sinking or Neutral Groundline	Good-Poor Varies/area	Good	
		Elimination of Vertical Lines	Poor-Impossible	Good	
		Degradable Lines	Medium-Poor	Medium-Good	
Area Closures					
		SAM's	Poor-Medium, Plannable	Medium-Poor	
		DAM's	Poor-Impossible	Medium-Poor	
		Critical Habitats	Medium, Plannable	Good	
Needed: Fishery-wide Gear modifications that can be used by fishermen but will not kill whales					
If sinking/neutral groundline and gillnet headrope breakaways are used industrywide then the remaining issue is vertical lines.					
If this can be solved, conflict between fisheries and right whales will be nearly eliminated.					

Recommendations:

- A high-priority gear research program that combines industry, gear developers, and scientists to develop fishery-effective and whale-safe vertical lines.
- More detailed reporting on entangling gear, including a standing industry team for the identification of gear type.
- An analysis of gear weight vs entanglement outcome.
- An industry evaluation of methods to reduce entanglements in vertical lines.
- Better real-time reporting of right whales to evaluate high, medium, and low risk fishing zones.
- Use risk factor analysis to determine the gear types, areas, and seasons, where entanglement risk is highest, and focus resources on those areas first.